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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/816,318 | 03/28/2001 | Ravi Prakash | CHA9 2001 0003US1 | 4786 |

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| EXAMINER | |
|---|---|
| HAVAN, THU THAO | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2672 | 7 |

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/816,318 | PRAKASH ET AL. | |
| | Examiner | Art Unit | |
| | Thu-Thao Havan | 2672 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10-15, 22-23, and 26* is/are rejected.

7)☒ Claim(s) *4-9,16-21,24,25 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Response to Amendment*

Claims **1-27** are pending in the present application.

### *Response to Arguments*

Applicant's amendment filed November 18, 2003 have been fully considered but they are not persuasive. As addressed below, Deering and Anderson et al. teach the claimed limitations.

Deering teaches weighting depends on a skew angle of the first image (col. 19, line 43 to col. 20, line 13; fig. 13) and he teaches a module (col. 5, line 40 to col. 8, line 54; figs. 4-5 and 7b) for antialiasing of text overlays on electronic images. In other words, Deering discloses the sample-to-pixel calculation units may be configured to calculate this distance (i.e., the extent of the filter at sample's position) and then use it to index into a table storing filter weight values according to filter extent. In another embodiment, however, the potentially expensive calculation for determining the distance from the center of the pixel to the sample (which typically involves a square root function) is avoided by using distance squared to index into the table of filter weights. Alternatively, a function of x and y may be used in lieu of one dependent upon a distance calculation. In one embodiment, this may be accomplished by utilizing a floating point format for the distance (e.g., four or five bits of mantissa and three bits of exponent), thereby allowing much of the accuracy to be maintained while compensating for the increased range in values. In one embodiment, the table may be implemented in ROM. However, RAM tables may also be used. Advantageously, RAM tables may, in

some embodiments, allow the graphics system to vary the filter coefficients on a per-frame basis. For example, the filter coefficients may be varied to compensate for known shortcomings of the display or for the user's personal preferences. The graphics system can also vary the filter coefficients on a screen area basis within a frame, or on a per-output pixel basis. Another alternative embodiment may actually calculate the desired filter weights for each sample using specialized hardware (e.g., multipliers and adders). The filter weight for samples outside the limits of the convolution filter may simply be multiplied by a filter weight of zero, or they may be removed from the calculation entirely. Once the filter weight for a sample has been determined, the sample may then be multiplied by its filter weight. The weighted sample may then be summed with a running total to determine the final output pixel's color value. The filter weight may also be added to a running total pixel filter weight, which is used to normalize the filtered pixels. Normalization advantageously prevents the filtered pixels (e.g., pixels with more samples than other pixels) from appearing too bright or too dark by compensating for gain introduced by the convolution process. After all the contributing samples have been weighted and summed, the total pixel filter weight may be used to divide out the gain caused by the filtering. Finally, the normalized output pixel may be output for gamma correction, digital-to-analog conversion (if necessary), and eventual display. Furthermore, the antialiasing module adjusts the inactive pixels of each character of the character text string based upon the surrounding pixels in the bit-mapping data. The anti-aliasing module overlays the electronic image with the active and adjusted text character pixels. In addition, Deering teaches the perturbed regular

grid positioning scheme is based upon the previous definition of a regular grid. The samples in perturbed regular grid scheme may be offset from their corresponding grid intersection. The samples may be offset by *a random angle* (e.g., from 0.degree. to 360.degree. or i.e. a skew angle) and a random distance, or by random x and y offsets, which may or may not be limited to a predetermined range. The offsets may be generated in a number of ways, e.g., by hardware based upon a small number of seeds, looked up from a table, or by using a pseudo-random function. Once again, perturbed regular gird scheme may be based on any type of regular grid (e.g., square, or hexagonal). A rectangular or hexagonal perturbed grid may be particularly desirable due to the geometric properties of these grid types.

**Claim Objections**

Claims **4-9, 16-21, 24-25,** and **27** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to anticipate or rendered obvious the technical features of claims **4-9, 16-21, 24-25, and 27**. The prior art fails to teach or suggest the step of creating the rotated image is provided by applying the following algorithm to the first image data: $V_o = K_h * K_v (V1 + V4 – V2- V3) + K_h (V3-V4) + K_v (V2-V4) + V4$.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1-3,10-15, 22-23, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (US patent no. 6,154,576) in view of Deering (US patent no. 6,489,956).

Re claims **1, 10, 23, and 26**, Anderson teaches rotating a first image in an image buffer, the method comprising the steps of extracting first image data from the image buffer (col. 4, lines 1-18) and creating a rotated image that is substantially free of aliasing error using weighted sums of data points of the first image (col. 23, line 50 to col. 24, line 44); and a computer program product (col. 8, line 41 to col. 10, line 45). In other words, Anderson teaches the sample-to-pixel calculation unit is operable to adjust the filtering of stored samples to reduce or adjust the filtering of stored samples to reduce or adjust artifacts. For example, the sample-to-pixel calculation unit may select and filter a first set of stored samples to generate first output pixels for display using a first filter, and may later select and filter a second set of stored samples to generate second output pixels for display using a second filter different than the first filter. The sample-to-pixel calculating unit may selectively adjust the filtering of stored samples in neighboring frames by simulation of various screen effect or display effects, such as panning, zooming, and the like such as position and rotation changes.

Anderson does not specifically disclose a module and weighting depends on a skew angle of the first image (fig. 13). However, Deering teaches weighting depends on

a skew angle of the first image (col. 19, line 43 to col. 20, line 13; fig. 13) and he teaches a module (col. 5, line 40 to col. 8, line 54; figs. 4-5 and 7b) for antialiasing of text overlays on electronic images. The antialiasing module adjusts the inactive pixels of each character of the character text string based upon the surrounding pixels in the bit-mapping data. The anti-aliasing module overlays the electronic image with the active and adjusted text character pixels. Therefore, it would have been obvious for one of ordinary skill in the art to combine a module of Deering to the system of Anderson because it would enable programs to run in a module to operate image rotation with no aliasing error (Deering: col. 5, line 40 to col. 8, line 54; figs. 4-5 and 7b).

As for the claimed limitation "weighting depends on a skew angle of the first image," Deering teaches weighting depends on a skew angle of the first image (col. 19, line 43 to col. 20, line 13; fig. 13). He teaches the perturbed regular grid positioning scheme is based upon the previous definition of a regular grid. The samples in perturbed regular grid scheme may be offset from their corresponding grid intersection. The samples may be offset by *a random angle* (e.g., from 0.degree. to 360.degree. or i.e. a skew angle) and a random distance, or by random x and y offsets, which may or may not be limited to a predetermined range. The offsets may be generated in a number of ways, e.g., by hardware based upon a small number of seeds, looked up from a table, or by using a pseudo-random function. Once again, perturbed regular gird scheme may be based on any type of regular grid (e.g., square, or hexagonal). A rectangular or hexagonal perturbed grid may be particularly desirable due to the geometric properties of these grid types. Therefore, it would have been obvious for one

of ordinary skill in the art to combine a skew angle of Deering to the system of Anderson because it would enable samples being offset by a random angle for a skew angle (Deering: col. 19, line 43 to col. 20, line 13; fig. 13).

Re claim **2**, Anderson discloses the document (col. 1, lines 18-40). In other words, Anderson teaches antialiasing of text overlayings on electronic images. Thus, the text in electronic images is in a document format. Turning now to figure 9, the samples are randomly offset from a regular square grid by x- and y-offsets. As the enlarged area shows, sample has an x-offset that specifies its horizontal displacement from its corresponding grid intersection point. Similarly, sample also has a y-offset that specifies its vertical displacement from grid intersection point. The *random offset may also be specified by an angle* and distance. As with the previously disclosed embodiment that utilized angles and distances, x-offset and y-offset may be limited to a particular minimum and or maximum value or range of values.

Re claims **3 and 15**, Anderson discloses a database (figs. 3-4 and 6). Anderson discloses a computer system with a CPU, RAM, DRAM, graphics managers, etc that consists of different data storage in a database.

Re claims **11-12**, Anderson discloses the data points of the initial image are in adjacent rows of the image buffer (col. 8, line 55 to col. 9, line 5; fig. 5). Pixilated character is represented by a plurality of pixel rows and a plurality of pixel columns in antialiasing module consisting of frame buffers.

Re claims **13-14**, Anderson discloses an image generation module (fig. 4). Figure 4 discloses antialiasing module which corresponds to an image generating module.

Re claim **22**, Anderson discloses an initial image stored in an image buffer (figs. 5-6). In figure 6, the raw image data is stored in the frame buffer that allows it to be manipulated in any forms.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**Inquiries**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu-Thao Havan whose telephone number is (703) 308-7062. The examiner can normally be reached on Monday to Thursday from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Thu-Thao Havan
Art Unit: 2672
January 14, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600